

INVESTIGATION

0F

FUEL OIL LEAK

FOR

HEXCEL

LODI, NEW JERSEY

BY

TENECH ENVIRONMENTAL ENGINEERS, INC.

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF NEW JERSEY.

REGISTRATION NO. GE 25662

6/27/84

Mark W. Tenney

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#### Purpose

The Hexcel Corporation plant located in Lodi, New Jersey has experienced a fuel oil leak from a buried storage tank. An investigation was begun in May 1984. The purpose of this report is to present the findings of this investigation. Included in this report are boring logs, laboratory testing program descriptions and results, soil descriptions, conclusions and recommendations.

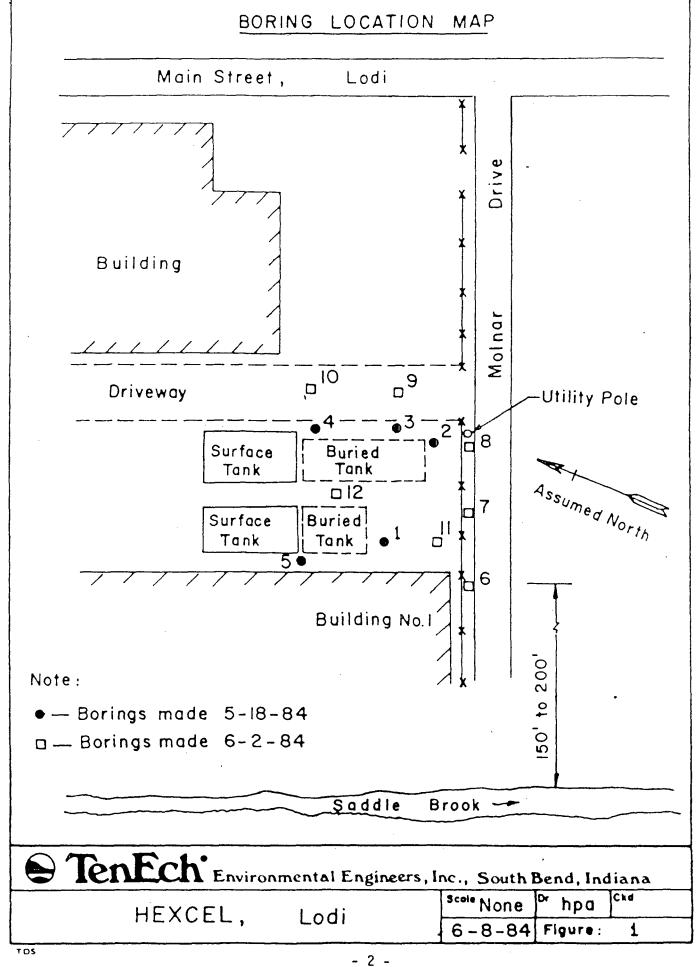
#### Subsurface Exploration Borings

In order to evaluate the lateral and vertical extent of migration of the fuel oil away from the buried tanks, twelve borings were made during May and June of 1984. Locations of the borings are shown on the attached map (Figure No. 1). It would have been desirable to have completely ringed the tanks with borings, but the existing structures, roadways and property boundaries limited possible drill sites. Areas north and west of the tanks could not be accessed.

Drilling to obtain samples was performed by the Warren George Company. All borings were accomplished using a Spreague and Henwood truck-mounted drill rig. Continuous soil samples were obtained utilizing a standard penetration sampler driven with a 140-pound hammer. The sampler was driven for a distance of two feet, then withdrawn and the sample removed. Blow counts for each six-inch increment of depth were recorded in the logs. Materials removed from the sampler were visually inspected and described in the field for purposes of the drill logs. Samples of the materials for laboratory testing were obtained for each depth interval sampled. Material for chemical testing was placed in glass jars and that for physical testing was placed in plastic sample bags.

On May 19, 1984 five borings (B1 through B5) were made in the vicinity of the tanks. Most of the borings were in very close proximity to the tanks, (i.e., within one or two feet of the tanks). Locations of the borings are shown on the attached location map (Figure No. 1). Borings were made on all but the north side of the tanks. Borings B4 and B5 are located on the east and west sides at the north end. Boring logs for the five holes are attached.

On June 2, 1984 seven new borings (B6 through B12) were made along the east and south sides of the tanks. These borings were located approximately ten additional feet away from the tanks. The locations of these new borings can be described as comprising half of a second larger diameter concentric ring around the tanks.



#### Soil Profile

The twelve borings performed identified three relatively consistant soil layers in the area of the tanks. A typical soil profile has been developed from the descriptions in the drill logs. Figure No. 2 is a graphical presentation of that profile. Each of the soil layers can be described as follows:

- 1. Roadway Surfacing And Concrete The entire area overlaying the tanks is covered by either concrete or roadway surfacing material. Underlaying the surfacing is either gravel or cinders. The combined thickness of these materials ranges from 0.5 to 1.5 feet and averages approximately 1.0 feet in thickness.
- 2. Soil Layer #1, Brown Sand The first soil layer consists of brown, relatively uniform sand and silt. This sand is moist and firm, with an average N value of approximately 10. The density of the sand is not uniform as N values ranged from 2 to 28. Thickness of this layer ranges from 1.5 to 5.0 feet.
- 3. Soil Layer #2, Grey Sand And Gravel Underlaying the brown sand is a grey sand and gravel layer. The size and percentage of gravel appears to increase with depth. It is highly probable that the boundary between the brown and grey sand is gradational. Thickness of this layer ranges from 2.0 to 3.5 feet. An average N value for this layer is 10 with values ranging from 1 to 22.
- 4. Soil Layer #3, Grey Silty Clay Consistantly and uniformly underlaying the entire area is a silty clay layer. This layer is grey, green and brown in color. Its consistancy is moist and firm. Thickness of this layer is consistantly greater than 1.5 feet. N values in the layer ranged from 3 to 22, with an average value of 10. Some naturally occurring organic materials are present in this layer.

There is a high probability that the upper part of the brown sand layer has been disturbed by past construction activities at the site. The potential also exists that it is a fill material, which had been brought in to level the plant site. It also appears to have been used as the backfill material around the tanks.

### TYPICAL SOIL PROFILE

Depth	Thickness		
0.5'— 1.5'	0.5' 1.5'	00000	Roadway surfacing, Concrete Gravel, Cinders, Misc. fill
	1.5' 5.0'		Brown Sand, Fine, Uniform, Moist, Loose
0.5' 5.0'	2.0'3.5'		Gradational Boundry  Brown & Grey,  Sand & Gravel
4.0'— 8.0	·	0.50006	Grey Silty Clay, Moist, Soft, Plastic

TenEch' Environment	onmental Engineers,	Inc., South	Bend, Inc	diana
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#### Physical Testing of Soils

Samples for physical testing of each soil layer were collected from Borings B9, B10, and B11. Material from each boring was composited into one bagged sample for each layer. It was necessary to composit material to obtain an adequate volume of material for testing. Laboratory tests performed on each sample consisted of a gradation analyses performed combining both seives and hydrometer. Atterberg limits were performed to determine the moisture content-consistency relationship for the soils and to allow the soils to be classified using the Unified Soil Classification System. Laboratory testing was performed by Stokley-Cheeks and Associates of Lexington, Kentucky. The laboratory work sheets and results are appended to this report. Laboratory procedures used were Standard ASTM Methods. Methods used were D422 for gram size, D423 for liquid limit, D424 for plastic limit and D2216 for moisture contents.

Table 1 presents a summary of the laboratory test results and Unified Soil Classification for each soil layer. It can be seen in the table that layers #1 and #2 are predominantly sand with significant percentages of both silt and gravel being present. Results also indicate that the soil layer #2 has approximately 20 percent more gravel and sand size particles than soil layer #1. These results indicate a coarsening downward within layers #1 and #2. The Unified Soil Classification for layer #1 of SM indicates that the layer consists of both silt and sand size particles. The classification of SP-SM for layer #2 indicates that gravel, sand and silt size particles comprise the material. Atterberg limits for both layers indicates that the soils are essentially non plastic.

Layer #3 is significantly different from the overlaying sands. It consists of 95 percent silt and clay size particles. The classification CL-ML for the soil indicates that it is a silty clay of low plasticity. Naturally occurring organic materials are present in this layer, but comprise a very small percentage.

Based on the Unified Soil Classifications for the two sand layers, the permeability of the layers could be expected to be within the range of 10<sup>-3</sup> to 10<sup>-5</sup> feet/minute. The presence of silt and clay size particles in these layers, depths from 0.5 to 8.0 feet, significantly reduces the potential permeability of these layers. The coarsening downward within the sand layers would result in an increasing permeability with depth. Permeability of the silty clay layer, located at a depth of 8.0 feet and below, could be expected to be on the order of 10<sup>-7</sup> feet/minute. This layer is essentially impermeable. The sand layers can be considered to be moderately permeable. The values of permeability were taken taken from tables of typical values in Design of Small Dams, by the Bureau of Reclamation and Soil Mechanics, Foundations and Earth Structures Navfac DM 7, by the Naval Facilities Design Command.

TABLE 1

PHYSICAL TEST RESULTS FOR SOIL

LAYER	#1	#2	#3
DEPTH	0.5 - 5.0	4.0 - 8.0	8.0 & BELOW
GRAVEL SAND SILT CLAY	4%	15%	0%
	58%	76%	5%
	31%	7%	75%
	7%	2%	20%
LIQUID LIMIT PLASTIC LIMIT PLASTIC INDEX	26	28	21
	25	27	17
	1	1	4
	SM	SP-SM	CL-ML

#### \_\_

#### Occurance of Oil

The objective of the exploration program was to locate and determine the extent of movement of fuel oil in the ground surrounding the tanks. For the twelve borings made, signs of oil were visually observed in nine of the borings. There was no oil visually observed in borings B3, B5 and B6. At a later date oil was observed on the water in B3.

The amount of oil occuring in the samples varied between the borings. For borings in close proximity to the tanks, oil could visually be seen in the samples. For the outer ring of borings, the amount of oil observed was less. This fact was established based on the driller's observations and comments during personal discussions with him. The presence of oil consisted of a sheen on the sample or on water in the sampler. It is also substantiated by visual inspection and comparisons of the samples.

The occurance of oil was principally within the grey sand and gravel layer. Within that layer, the oil appeared to be greater near the bottom. This would tend to be expected as the layer is coarser toward the bottom and permeability is higher. Some trace amounts of oil were observed within the brown sand layer.

Significant conclusions which can be drawn follow:

- Oil has leaked from the tank and is principally present in the grey sand and gravel layer, and backfill surrounding the tank.
- The amount of oil present in the decreases with distance from the tank.
- The permeability of the sand and gravel layers, depths ranging from 0.5 to 8.0 feet, is moderate and the oil could have moved some limited distance through the layers.

#### Oil Content Testing

For the purposes of determining oil content of the soil surrounding the tanks, samples were tested from three borings. Samples covering the entire thickness of layers #1, and #2 and the top of layer #3 were tested from borings B6, B8 and B10. The oil and grease content was determined using the standard method given in "Procedures For Handling and Chemical Analysis of Sediment and Water Samples," (EPA/CE-81-1), May, 1981. The exact method used was; Oil and Grease Method 1, Freon Extraction, page 3-284. This method reports the free and extractable oil and grease content of a material on a dry weight basis. Results are reported in units of mg/Kg or parts per million. Laboratory testing was conducted by Aqualab, Inc. of Streamwood, Illinois. The laboratory report is appended to this report.

Table 2 presents a summary of the laboratory test results for the oil and grease content testing. Reported in the table is the oil content in parts per million and also in percentage by dry weight. Within the sand layers, the oil contents range from 1,250 to 10,100 parts per million. Within the silty-clay layers, the oil contents range from 149 to 650 parts per million. On review of the results in the table, it can be seen that the last sample in each boring has a significantly lower oil and grease content than those at shallower depths. The last sample in each boring is from the third soil layer, the silty-clay. Within the sand layers the oil content averaged 0.48 percent. Within the silty clay layer, the oil content averaged 0.03 percent. It is highly probable that the 0.03 percent value is a natural background amount due to the naturally occurring organics present in the soil.

Based upon a review of the New Jersey Hazardous Waste Regulations, it would appear that none of the soil samples tested would be representative of a hazardous waste. The New Jersey regulations (Revision 84-1) define New Jersey Hazardous Waste Number X725 as follows:

Oil spill cleanup residue which: A) is contaminated beyond saturation; or B) the generator fails to demonstrate that the spilled material was not one of the listed hazardous waste oils, (see page 8-14a of the New Jersey Hazardous Waste Regulations).

Fuel oil, when stored and used for its original purpose, is not a hazardous waste under the regulations, so only Part A must be addressed. The soil samples collected at the Lodi facility all contained 1.01 percent oil or less. None of the samples were found to be saturated with oil and, therefore, should not be considered hazardous wastes.

TABLE 2

SAMPLE OIL CONTENT

BORING	DEPTH	SAMPLE	OIL CONTENT	PERCENT OIL
NO.	(FT)	NO	PPM (Mg/Kg)	CONTENT
B6	1.0 - 3.0	8000	1250	0.13%
	3.0 - 5.0	8001	3880	0.39%
	5.0 - 7.0	8002	3610	0.36%
	7.0 - 8.0	8003	4000	0.40%
	9.5 -10.5	8004	149	0.01%
B8	2.5 - 5.5	8009	7950	0.80%
	5.5 - 7.0	8010	6070	0.61%
	8.0 - 9.0	8011	650	0.07%
B10	3.0 - 5.0	8013	10100	1.01%
	5.0 - 7.0	8014	3890	0.39%
	7.0 - 8.0	8015	2280	0.23%
	9.5 -11.0	8016	174	0.02%

#### Ground Water Levels

The occurance of ground water was noted in all the borings. Water levels in all the borings was measured on June 2, 1984. The depth below the existing ground surface to the water level in the holes ranged from 4.0 to 4.5 feet. Several of the holes had caved in at that depth and a wet sand slurry was present below that depth.

It should be noted that ground water levels may have been abnormally high at the time the meaurements were made due to the unusually heavy rains which had occured.

Factors controlling ground water movement and ground water levels in the area are as follows:

- Saddle Brook river located approximately 150 to 200 feet west of the tanks is the hydrostatic low in the immediate area of the tanks. Flow of ground water in the sand layers could be expected to be toward the river.
- The location and elevation of the silty clay layer has pearched the water table and prevented vertical movement of water and oil through the layer.
- The permeability of the sand layer is moderate, 10<sup>-3</sup> to 10<sup>-5</sup> feet/minute. Estimating that the Saddle Brook river is located 5 feet lower in elevation than the water table in the borings, the maximum flow velocity twoard the river would be 0.05 feet per day based on the following calculation (with an assumed permeability of 10<sup>-3</sup> feet/minute:

$$V = ki$$
  
 $V = (1 \times 10^{-3} \text{ ft/min}) \frac{5 \text{ ft}}{150 \text{ ft}} \times 1440 \frac{\text{min}}{\text{day}}$   
 $V = 0.05 \text{ ft/day}$ 

If the permeability is  $10^{-5}$  feet/minute, the flow rate would be 0.0005 feet/day. These calculations indicate that the movement of ground water toward the Saddle Brook river is at a slow to moderate rate.

#### Conclusions

Conclusions which can be drawn based on the information which is available are as follow:

- Fuel oil is present in the sandy soils immediately surrounding the buried tanks. The vertical extent of oil contaminated soil is limited because of the presence of the silty clay layer.
- The amount of oil present in the sand and gravel layers, depths ranging from 0.5 to 8.0 feet, decreases with distance from the tanks. This fact is supported by both visual observations and laboratory test results. The moderate permeabilities of the sands has limited the lateral migration of the oil.
- The silty clay layer has not been contaminated by the fuel oil. Visual observations and laboratory test results support this fact.
- Soils located at a distance of 10 feet or greater from the tanks have oil contents equal to or less than 1.01 percent based on their dry weight.
- Thickness of the sand and gravel layer ranges from four to eight feet. Flow of water in this layer would be expected to be toward the Saddle Brook river, located to the south-west of the buried tanks. If additional sampling or drilling is desired, to check the downgradient conditions in more detail, this could be conducted in the vicinity of borings Number 1 and 11.

### STOKLEY-CHEEKS AND ASSOCIATES, INC.

#### GEOTECHNICAL ENGINEERS & GEOLOGISTS

#### ESTABLISHED 1956

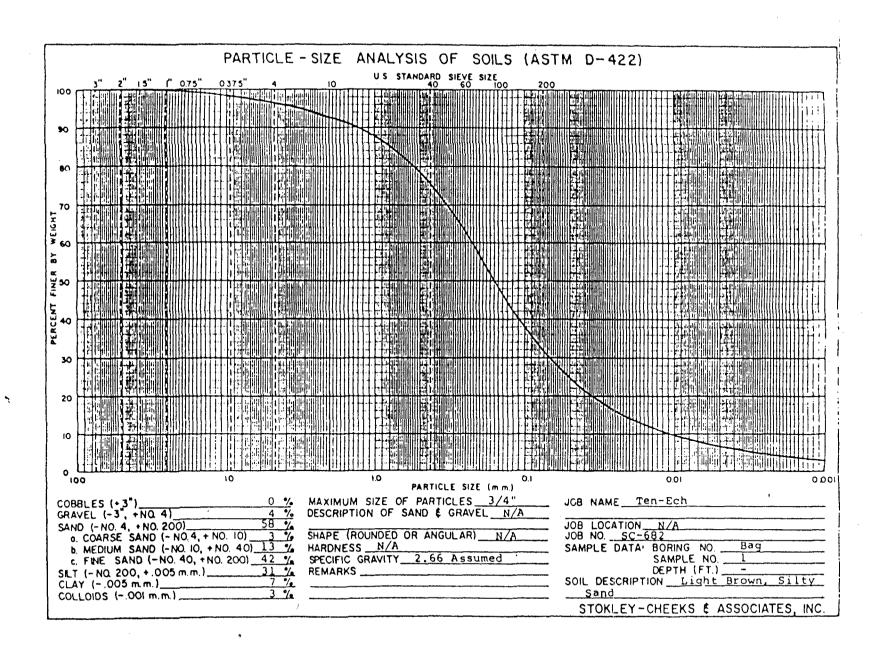
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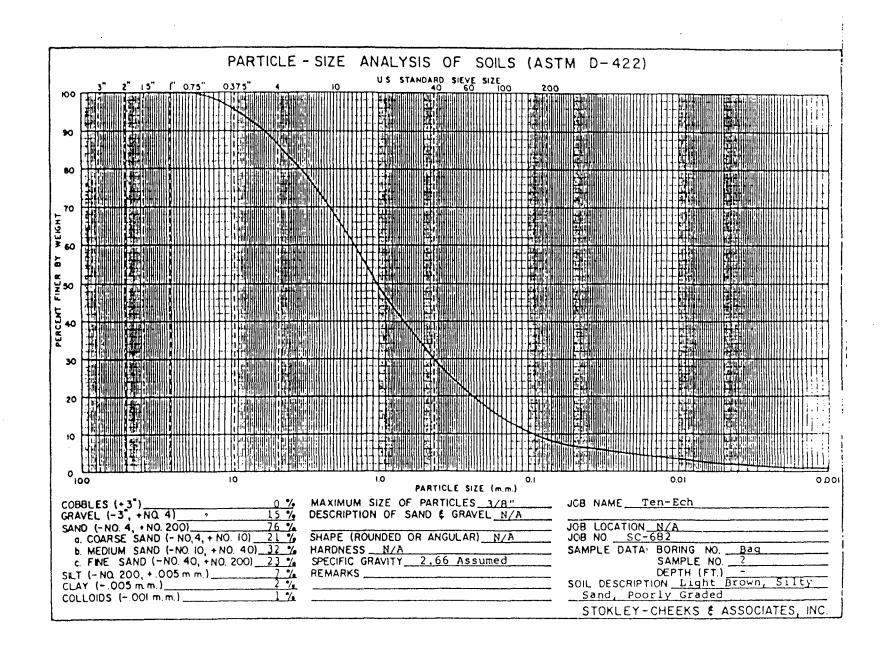
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										Gf	RAIN S	IZE	1								}			
BORING NO.	SAMPLE NO.	DEPTH, FEET	SAMPLETYPE	SOIL CLASSIFICATION	NATURAL WATER CONTENT.*	WET UNIT WT. PCF	DRY UNIT WT, PCF	SPECIFIC GRAVITY	GRAVEL. %	SAND	FINES (SILT & CLAY) .	SILT. %	CLAY, %	רוסחום רואו ב	PLASTIC LIMIT	PLASTICITY INDEX	UNCONFINED STRENGTH, KSF	0. DEGREES	COHESION, PSF	MAX. DRY DENSITY	OPTIMUM MOISTURE	COMPRESSION INDEX	СВЯ	
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L					STOKLEY-CHEE	KS & ASSOCIATES, INC.

# CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES ASTM Designation: D 2487 - 83 (Based on Unified Soil Classification System)

### SOIL ENGINEERING

						Sort C	lassification
	Criteria for Ass	ugning Grad	p Symbols and Group Na	imes Using Labor	alory Tesis*	Group Symbol	Group Name®
Coarse-Grained Soils  More than 50% retained on	Gravels More than 50% coa	rse	Clean Gravels Less than 5% lines <sup>C</sup>	Cuz4 and 151	Cest	GW	Well graded gra
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				Fines classify a		GC	Clayey gravel'
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only organic soils	Pr		nic matter, dark in color,		N 0/40	PT	Organic sitt <sup>e cw</sup>
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ABased on the maserial potenty is all held tample contained coolers or both in a coolers or b	the 3-m (P5-mins) serve is or beuteers, or both, add it group name unre dual symptots in clay with pia in clay in the dual symbots are thay in the clay	Fit and con- name  If and con- name  Git lines of SCISM  If soot con- name  Add  H. SCISM  Add  Add  Add  Add  Add  Add  Add  A	For classification of and fine-grand Tests  Far classification of and fine-grand Tests  Equation of A - ine the first of the first than the f	and organic odor	As Asserburg binds birty clay and contains 1 and contains 2 and framer and "In soil contains 2 and "tandy" to to the soil contains 2 and "tandy" to to the soil contains 2 and place and p	is prof on harden is to 29% phur hichever is pro 30% phus no group name 130% phus Ne ty to group n on or above " 150% fine 150% films	Peal and ores, soil is a CLI-by the 200, and "wen systemment 200, predominantly ta 200, predominantly are
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JOB LOCATION	WARREN	GEORGE	. INC.	SHEET 1 OF 1
_205 Main_St		JERSEY AVENU	E	LOCATION Loci, N. J.
Lodi, N. J.		O. BOX 413	,	HOLE HO
	JERSET	CITY, N.J. 0730:	٤	LINE & STA.
	FOR: Hexcel Con	rporation		OFFSET
ĎЕРТН <u>53"</u> FT FT.	CASUNG OUT DATE:	DATE, START: 5	/19/8/	GROUND ELEVATION
DEPTH FT. ALL CA		i		GROUND WATER ELEVATION.
PI: ALL CA	31MG OOT DATE:	DATE, FINISH:_		PROGRA BY LEW STEAM LOW
CASING 0.D 1.D		MHER 300-140	L#S.	HAMMER FALL
DIAMOND BIT SIZE 2	INSIDE LENG	TH OF SAMPLER	18.	CASING 24 SAPLER 30
CASING SAMPLE DEPTH		i	PROFILE FI	IELD IDENTIFICATION OF
# 중[ 1 등 중 CLCY- / (CC		iche ich	1 .	SOILS
F00T		1 12-18 MOISTUR		RE MARKS
		1	6 (	nders Fill
1 0-21	4-3-4-		Br	own Medium Fine Sand
27-41	1-1-3-	<del>- i i</del>	19 4 3. 4	e Cravel
1		<del></del>	Mec	Com Sand Medium Coarse
3 4'6'	3-4-4	1 <del>-</del> 6		ivel, city
6'-8'	Δ	5-7- 071		
4	1-4-6		7:31 Erow	n Fine Silty Clay
10 - 31-101	<del>5-</del> 4-	3 <del>-13    </del>	31101 . 5ro	wn Fine Silty Sand
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Soils Engineer:			ميعدها المعادما	
Brilling Inspector:		_ molpor:	ra:	A Jones

JOB LOCATION  205 Main 5:	FOR: Hexcel Corp.  ASING OUT DATE: D		LOCATIONMain_St_ Loci  NOTE NOL-1  LINE 4 STA  OFFSET  GROUND ELEVATION  GROUND WATER ELEVATION
SAMPLER O.D. 1.D. DIAMOND BIT SIZE 4		OF SAMPLER	
CASING SAMPLE DEFINE TO FOOT	Ch SMPLER		FIELD IDENTIFICATION  OF  SOILS  REMARKS  CONCRETE  LINCOTS TITL
2 2:24	3-3-1-2	11151	Srown Fine Silt, Said
5 81-101	A 10-5-4-5 ( 10-5-4-5 ( 1-1-2-4	H. C.	ay irown Medium Coarse Sand ledium (ravel - Cils rown Fine Silt, Sand Little
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No Seite Engineer:		Driller: (e	orge Kutschere

										Taures as			
	OB LOC			W	ARREN (					SHEET 1 OF 1			
نــ	عط 205	in Stra	·e1		FOOT OF			E	-	MOLE NO. # 3			
L	odi. N	. J.				D. BOX	413 4. J. 07303						
				500	Hexcel (orp					LINE & STA.			
_=		_===		FOR:	HEXCEL COLD	i i i			OFFSET				
ĎE	PTH	54	FT FT. C	ASING DU	T DATE:	DATE.	START:	12 184	_   64	ROUND ELEVATION			
DE	PTH		_ FT. ALL CAS	ING OUT	DA TE:	DATE.	FIRESH: _		_  6	ROUND WATER ELEVATION			
CA:	SING (	O . D	1. D		WEIGHT OF NA	MMER	300-140		LBS.	NAMMER FALL			
-			1.0		INSIDE LENGT	H 05 5	LMPI FE		in	CASING 24 SAMPLER	30		
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	FOOT				F 6-6 1 0-37	12-18	MOIS TURE	<u> PC+</u>		REMARKS			
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JOB LOCATION.	WARREN	SEØRGE. I	NC. SHEET OF 1	—
	i	JERSEY AVENUE	LOCATION LOGI II	
Lodi N. 1	1	). BOX 413 CITY, N.J. 07303	MOLE NOE_L	
			LINE & STA.	
	FOR: Hercal Core	pration	OFFSET	===
DEPTHFTFT. C	ASING OUT DATE:	DATE, START:5/	18 '84 GROUND ELEVATION	
DEPTHFT. ALL CAS	ING OUT DATE:	DATE, FINISH:	GROUND WATER ELEVATION.	
CASING 0. D 1. D	WEIGHT OF MA	HHER 300 -140	LES. HAMMER FALL	
SAMPLER 0.0 1.D		H OF SAMPLER	1	
DIAMOND BIT SIZE		, VI 34-1 LL		
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12 21-41	4-5-5-7		Crayish Brown Fine Coarse	<u> </u>
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3 41-61	6-8-9-9	<u>-</u>  5'	6" 7'6" (ray Coarse Sand Cily	
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8:-10:-	4-5-4-6		Cray Silty,Clay 67901 larred On Lenses	
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Boils Engineer:	····	Griller:	Leorge Kulchera	

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JOB LOCATION.	WARREN	-		SHEET 1			
205 Main Street		JERSEY AVENU	Ε		LOCATION Lodi, N. J.		
Codi, K. J.		D, BOX 413 CITY, N.J. 07303	3	HOLE NO. #-5			
		el Corp.		LIRE & STA.			
				OFFSET			
DEPTHFT. C		1		GROUND ELEVATION			
DEPTHFT. ALL CAS	ING OUT DATE:	DATE, FIHISH:_		GROUND WATER ELEVATION	D#		
CASING 0.01.0		HHER303-140	L#S.	HAMMER FA	<b>u</b> l		
DIAMOND BIT SIZE 2	I LEI AT I THEY	H OF SAMPLER		CASING SAPE	.61		
· · · CASING	bi (m) P[R	4"   DF NS ITY	PROFILE F	IELD IDENTIFICATION			
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### IES DONING MECHAN

Date Stated 6-2-84 Date Completed 6-2-84 Station No.  Size Casing Total II Hole No B.6 Surface Elev Short  Size Casing Short I VI Short  Sample Hammler WI 140 # Libi. Drop 30 Int.  Size Auger  ELEVATION DEPTH CLASSIFICATION of MATERIAL TIME SAMPLE NO. CORE CORE REMARKS  Road Surfacing and gravel 7999  1.0 Redish Brown Sand Moist, Firm 9/9/9/7 8000  3.0 S/9/0/21 8001  4.0' Water Leve  5.0  6.0 Redish Brown And Grey Sand and Gravel Neur Botton of Layer Size Number of Layer Size Number Sand and Gravel Neur Botton of Layer Size Number Size No. Of Course Sand and Gravel Neur Botton of Flayer Size Number Size No. Of Course Sand and Size No. Of Course Size Number Size No. Of Course No. Of Co	Ground Wate	er Elev _		(	Consultant			
Stee Casing	Date Started	6-2-	84 Date Completed 6-2	-84	Station No.			
Sheet Sheet Sheet Sheet Sheet Somple Marminer Wit 140 # LDS: Drop 30 Ins.  Size Core Size Auger  ELEVATION DEPTH CLASSIFICATION OF MATERIAL TIME SANDLE NO. ARUN RECOVERY COSS REMARKS  Road Surfacing and Gravel  Redish Brown Sand Moist, Firm 9/9/9/7 8000  3.0  S/9/0/21 8001  4.0' Water Leve Core Society Sand and Grey Sand, Wet,  7.0 Course Sand and Grey Sand and Grey Sind Wet,  7.0 Course Sand and Grey Silty Clay  Grey Silty Clay  Varved, Firm, Moist  9.0 Flastic 7/9/13/14 8004					Hole No. <u>B6</u>	Surfa	ce Elev	·
Size Auger  CLASSIFICATION BLOWS & SAMPLE NO COME CORE REMARKS  ROAD SUPPLIATION OF MATERIAL 7999  1.0 Redish Brown Sand Moist, Firm 9/9/9/7 8000  3.0 S/9/10/21 8001  4.0' Water Level  5.0 Redish Brown And Grey Sand and Grey Sand and Grey Layer Botton of Layer  8/10/10/9 8003  8/10/10/9 8003  Possible Sho of Oil, Odor flastic 7/9/13/14 8004	Sample Size				•			Sheets
ELEVATION DEPTH CLASSIFICATION OF MATERIAL BLOWS & SAMPLE NO. CORE OF REMARKS  Road Surfacing and Gravel 7999  Redish Brown Sand Moist, Firm 9/9/9/7 8000  3.0  5/9/10/21 8001  4.0' Water Leval Signification of Core Remarks  4/0' Water Leval Signification of Core Remarks  4/0' Water Leval Water Leval Signification of Core Sand and Gravel Near Botton of Layer Grey Silty Clay  Varved, Firm, Moist  9.0 Flastic 7/9/13/14 8004	Toral No. Co	re Boxes		9	Sample Hammer Wt	140 #	Lbs.;	Drop 30 Ins.
Redish Brown Sand Moist, Firm  Sylphola 8000  Redish Brown And Grey Sand, Wet,  7.0 Course Sand and Grey Clay  8.0 Grey Silty Clay  Varved, Firm, Moist  9.0 Flastic  TIME ARUN RECOVERY LOSS REMARKS  RE	Size Core			S	Size Auger			
1.0 Redish Brown Sand Moist, Firm 9/9/9/7 8000  3.0  5/9/10/21 8001  4.0' Water Leve  5.0  6.0 Redish Brown And Grey Sand, Wet, 7.0 Course Sand and Gravel Neur Botton of Layer  6-rey Silty Clay Varved, Firm, Moist 9.0 Flastic  7/9/13/14 8004	ELEVATION	DEPTH	1	1		{		REMARKS
Redish Brown Sand Moist, Firm  9/9/9/7 8000  5/9/10/21 8001  4.0' Water Leve  5.0  6.0 Redish Brown And Grey Sand, Wet,  7.0 Course Sand and Gravel Near Botton of Layer  Grey S. Ity Clay Varved, Firm, Moist  9.0 flastic  7/9/13/14 8004		1.0	Road surfacing and gravel		7999			
5/9/10/21 8001  4.0' Water Leve  5/9/10/21 8001  4.0' Water Leve  5/9/10/21 8001  4.0' Water Leve  4.0' Water Leve  5/9/10/21 8001  4.0' Water Leve  5/9/10/21 8002  Flashic Shood Sold Shood Sh				9/9/9/	17 8000			
6.0 Redish Brown And Grey Sand, Wet, 7.0 Course Sand and Gravel Neur Botton of Layer  6.0 Redish Brown And Grey Sand and Gravel Neur Botton of Oil, Odor  8.0 Grey Silty Clay  Varved, Firm, Moist  9.0 Plastic  7/9/13/14 8004	1	3.0	:	5/9/10/	21 8001			4.0' Water Leve
Redish Brown And Grey Sand, Wet,  7.0 Course Sand and Gravel Neur Botton of Layer  8.0 Grey Silty Clay Varved, Firm, Moist  9.0 Flastic  7/9/13/14 8004					/2 (2002			
8.0 Grey Silty Clay  Varved, Firm, Moist  7/9/13/14 8004			Redish Brown And	14/12/10	8002	1 1 2 3 4 4 4 4 7 7		
9.0 Varved, Firm, Moist 7/9/13/14 8004		7.0	Course Sand and Gravel Neur Botton of Laver					
11.0		8.0	Grey Silty Clay		9 8003	! ! !	•	,
11.0 Stopped Hole 11.0'		9.0	Plastic	7/9/13/	/14 8004			_
	·	11.0	Stopped Hole 11.0	•				_
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i Driller <u>War</u>	ren Ge	orge, Inc. (G. Kutschera)	Proje	ect No. Hexc	el Corp	orat	tion, Lodi
Ground Wate	er Elev		Cons	sultant			
		84 Date Completed 6-2-6		<b>~</b>	Sucta		
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			Snee	· · · · · · · · · · · · · · · · · · ·	140#		20 "
						_ LOS	Drop <u>30                                    </u>
Size Core			Size	Auger	<del></del>		<u> </u>
ELEVATION	DEPTH	CLASSIFICATION OF MATERIAL	BLOWS &	SAMPLE NO. & RUN	CORE RECOVERY	LOSS	REMARKS
		Road Surfacing, Gravel Cinders, Fill, Misc.					Sample Not Take
	1.5	Brown Silty Sand Uniform, Loose, Moist	6/5/5/2	8005			
	3.5	i :					
		Redish Brown And Grev Sand, Course	1/1/2/1	8006			4.2' Water Leve.
	i I	Grey Sand, Course Sand And Gravel At Bottom of Layer	2/2/1/	8007			2 Show of Oil
	7.0	Wet, Loose Grey And Green	2/3/3/6				
•	/. 3	Silty Clay Varved, Moist, Plastic	1/2/5/6	8008			
	9.5	Stopped Hole 9.5'					<del>_</del>
1							

		eorge, Inc. (G. Kutcher			er corpora	tion, Lodi
Ground Wat		(11)		nsultant		
	-	84 Date Completed 6-2-		ition No Ile No	C -4 C	
		Total		eet	-	1
						: Drop Sheets
				e Auger		. Drop Ins.
=======================================	T	CLASSIFICATION	BLOWS &	SAMPLE NO	CORE COR	)c
ELEVATION	DEPTH		TIME	& RUN	RECOVERY LOS	DEMARKS
		Rocdway Surfacing, Gravel, Cinders, Fill Very Firm	18/19/7			Sample Not Take
	1.5		5/7/4/11			No Sample Recover
:		Brown, Grey & Black Sund and Gravel Loose, Wet	5/5/4/4	8009		Odor of Oil (4.5° Water = eve
	5.5		5/5/8/10	8010		Oil In Gravel
	7.0	Grey, Green & Brown				
¢	7,5	Firm, Moist, Plustic	7/10/12/1	5 801/		
			, , ,			
	9.5	Stopped Hole 9.5				
:						
1						
		·	: :			

Ground Wate		eu 5 6 4 4-7	-		tant		•	
		Date Completed 6-2			n No	Surta	ća Flav	
		Total			10. <u>D</u>			•
Total No. Co								Droptns
Size Core					ruger			
		CLASSIFICATION	BLOWS		SAMPLE NO.	CORE	CORE	
ELEVATION	DEPTH	OF MATERIAL	TIME		& RUN	RECOVERY	LOSS	REMARKS
		Concrete & Gravel						Sample Not Take
	0.5	Q ( ) F	<del></del>	$\dashv$		<u> </u>		
		Brown Sand, Frim, Moist, Some Small Gravel	7/5/6/	7	8020			
	2.5	Grave'l						
	1.5							7
•			12/14/14	1/2	8021			Some 1 on water in sung
	<i>,,</i> , ,	$\wedge$ $\wedge$ $\wedge$ $\wedge$ $\wedge$ $\wedge$						Water Leve
	4.5	Grey Sand And Gravel, Firm, We						
		Grey Sand And	18/01/51	8	8022			7 5 how of 011
		Gravel, Firm, We						Show of Oil
	6,5				)			
			7/4/5/	4	8023			
	8.0	Redish Brown &	_					
	8.5	Grey Silty City		Ť				•
		Grey Silty City Moist, Soft, Plustic	2/2/6/	6	8024			
}								
	10.5	Stopped Hole 10.	5	$\top$				
1								
) [		•						
		: ! !						
1		İ	ţ		C	!		

Driller Wal	ren G	eorge, Inc. (6. Kutcher	n)	Projec	OI No. Hexc	el Corps	croti	ing Lodi
Ground Wate	er Elev		(	Consi	ultant			
Date Started	6-2-	84 Date Completed 6-2-	84	Static	on No.			
Size Casing _		Total						·
Sample Size				Sheet		of		Sheets
Total No. Co	re Boxes		;	Samp	le Hammer Wt	140#	Lbs	Drop <u>30"</u> Ins.
Size Core			;	Size A	Auger			
ELEVATION	DEPTH	CLASSIFICATION OF MATERIAL	BLOWS	- 1	SAMPLE NO. & RUN	CORE	CORE	REMARKS
	0.5	Concrete Gravel						Samples Not Taken.
:		Brown Sand Moist, Loose	7/6/5/	4	8012			
	3. <i>0</i>		2/2/2	1/1	8013			4.4' Water Leve
		Brown & Grey Sand & Gravel Wet, Loose	1/2/1	/1	8014			
	•	Redish Brown Silty Clay Learn Worst, Firm, Plastic	2/5/5	15	8015			Show of Ciler Sweder in Exemple
1	9.0	Worst, Firm, Plastic	4/5/5,	/5	8016			• •
	11.0	Stopped Hole 11.0	,					_
i					c			

0.00.00.00.00	r Elev. 👱		C	Consultant			
		84 Date Completed 6-2-	84 s	itation No.			
Size Casing _		Total	_ft. H	Hole No. 8 11	Surfa	ce Elev	·
•			S	heet			
Total No. Cor	re Boxes		S	ample Hammer Wt	140#	Lbs.,	Drop 30" Ins
Size Core			Si	lize Auger			
ELEVATION	DEPTH	CLASSIFICATION OF MÁTERIAL	BLOWS &	& SAMPLE NO. & RUN	CORE RECOVERY	CORE LOSS	REMARKS
		Concrete					
	0.5	Gravel & Cinclers					Samples Not Ta
	1.0						
		Brown Sand Moist, Firm	3/6/3	Bag			
	2 6						
)   	2.5	Becomes Loose & wet					Slight Show of
		Felow 2,5"	2/1/1/	1 Bag			On Weter In in
	4.5	$\Lambda$ $\Lambda$ $\Lambda$ $\Lambda$ $\Lambda$ $\Lambda$					- Water le
	: : !						
į		Grey Sand + Gravel, Loose, wet	0/1/0/	6 Bag			Poil In Bottom
	<u>5</u>						Sumpler
		: : :			; !		Golf In Grave.
! 1 !			4/4/2/	's Bag			
	1,5	Redish Brown & Grey	1/1/0/	July			
1	0 5	Silty Clay Loam					
l	8,3	Redish Brown & Grey Silty Clay Loam Moist, Firm, Flastic		0			
			3/4/5/	17 Bag			
	9.5		,				
		Stopped Hole 9.5					
	] 				) 		
				·			



15 June 1984

analytical report

. TENECH ENVIRONMENTAL ENGINEERS 744 W. Washington South Bend, IN 46601

Attn: Mr. Charles Bishop

SAMPLE DESCRIPTION: "Hexcel"

state taken	carb received	6/5/84

Sample Description	<u>Oil &amp; Grease</u> (Freon Solubles)
	mg/kg
8000	1,250.
8001	3,880.
8002	3,610.
8003	4,000.
8004	149.
8009	7,950.
8010	6,070.
8011	650.
8013	10,100.
8014	3,890.
8015	2,280.
8016	174.

Results on a dry weight basis

Robert N. Bucaro